

Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/US05/007214

International filing date: 04 March 2005 (04.03.2005)

Document type: Certified copy of priority document

Document details: Country/Office: US
Number: 60/550,466
Filing date: 05 March 2004 (05.03.2004)

Date of receipt at the International Bureau: 18 April 2005 (18.04.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)



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THE UNITED STATES OF AMERICA

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March 31, 2005

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APPLICATION NUMBER: 60/550,466

FILING DATE: *March 05, 2004*

RELATED PCT APPLICATION NUMBER: *PCT/US05/07214*



Certified by

Under Secretary of Commerce
for Intellectual Property
and Director of the United States
Patent and Trademark Office

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VIA EXPRESS MAIL
EV 378778825 US

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Re: Our Docket No. 04100-PPA

Dear Sir:

Enclosed please find the following:

1. New U.S.A. provisional patent application entitled "FLUID FLOW METER BODY WITH HIGH IMMUNITY TO INLET/OUTLET FLOW DISTURBANCES"; including specification and claims (3 pages), and drawings (3 sheets); KURZ, Inventor.
2. Form PTO/SB/16 duly executed.
3. Our check No. 01524 in the amount of \$80.00 to cover the application filing fee.

CERTIFICATE OF TRANSMITTAL

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: March 5, 2004

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By: Diane Panicho
Diane Panicho

4. Our post card. (Please date stamp and return).

Applicant is a small entity.

Please address all correspondence to:

ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP
502 Washington Avenue, Suite 220
Towson, MD 21204

The inventor is:

Jerome L. KURZ
33 Los Robles Road
Carmel Valley, CA 93924

He is a citizen of the United States of America.

If there are any additional fees, please charge our Deposit Account No. 02-2839.

Thank you for your cooperation and assistance.

Respectfully submitted,


Leonard Bloom

LB/dtp

Enclosures

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No. EV 378778825 US

INVENTOR(S)					
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)			
Jerome L.	KURZ	33 Los Robles Road Carmel Valley, CA 93924			
Additional inventors are being named on the <u>N/A</u> separately numbered sheets attached hereto					
TITLE OF THE INVENTION (500 characters max)					
FLUID FLOW METER BODY WITH HIGH IMMUNITY TO INLET/OUTLET FLOW DISTURBANCES					
Direct all correspondence to: CORRESPONDENCE ADDRESS					
<input type="checkbox"/> Customer Number: <div style="border: 1px solid black; width: 250px; height: 30px; display: inline-block;"></div>					
OR					
<input checked="" type="checkbox"/> Firm or Individual Name: ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP					
Address: 502 Washington Avenue					
Address: Suite 220					
City: Towson		State: MD		Zip: 21204	
Country: U.S.A.		Telephone: 410-337-2295		Fax: 410-337-2296	
ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/> Specification Number of Pages <u>3</u>					
<input type="checkbox"/> CD(s), Number _____					
<input checked="" type="checkbox"/> Drawing(s) Number of Sheets <u>3</u>					
<input type="checkbox"/> Other (specify) _____					
<input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76					
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT					
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.					
<input checked="" type="checkbox"/> A check or money order is enclosed to cover the filing fees.					
<input checked="" type="checkbox"/> The Director is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: <u>02-2839</u>					
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.					
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> FILING FEE Amount (\$) \$80.00 </div>					
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.					
<input checked="" type="checkbox"/> No.					
<input type="checkbox"/> Yes, the name of the U.S. Government agency and the Government contract number are: _____					

[Page 1 of 2]

Respectfully submitted,

Date March 5, 2004

SIGNATURE

REGISTRATION NO. 18,369

(if appropriate)

TYPED or PRINTED NAME Leonard BloomDocket Number: 04100-PPATELEPHONE 410-337-2295**USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT**

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Provisional Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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UNITED STATES

PROVISIONAL PATENT APPLICATION

Title: FLUID FLOW METER BODY WITH HIGH IMMUNITY
TO INLET/OUTLET FLOW DISTURBANCES

Inventor: Jerome L. KURZ

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**FLUID FLOW METER BODY WITH HIGH IMMUNITY
TO INLET/OUTLET FLOW DISTURBANCES**

The present invention deals with the age-old flow measurement accuracy and repeatability problems caused by Flow Meter Body upstream and/or downstream flow disturbances, such as elbows, line size changes, valves and other flow obstructions. This invention incorporates the exceptional fluid velocity profile flattening properties of Flow Nozzles in combination with Flow Diffusers placed upstream and/or downstream of the Flow Nozzle in order to create immunity to these problems. A Flow Diffuser placed upstream of the Flow Nozzle is used to decelerate the fluid velocity thereby allowing the fluid to expand, flow through the Flow Nozzle and present a repeatable, invariant, flat velocity profile to the Flow Sensor located in the Flow Measurement Section downstream of the Flow Nozzle. The upstream Flow Diffuser also allows the user to match the Flow Meter Body inlet to a smaller inlet pipe than the Nozzle Inlet Section and avoids the common problem of turbulence generation and static pressure loss caused by field welding and fabrication of adapters. A Flow Diffuser placed downstream of the Flow Measurement Section and Flow Nozzle is used to recover a large percent of the pressure drop across the Flow Nozzle, thus reducing the pressure drop through the Flow Meter Body. This invention provides a Flow Meter Body with exceptional immunity to flow disturbances, requires much less upstream and downstream pipe diameters, conveniently mates to a wide range of pipe sizes, eliminates costly field welding and fabrication of pipe adapter fittings and has a very low end-to-end static pressure loss compared to existing Flow Meter Bodies.

CLAIMS:

1. A Fluid Flow Meter Body incorporating a Flow Nozzle and Flow Diffusers placed upstream and/or downstream of the Flow Nozzle with a Flow Measurement Section downstream of the Flow Nozzle designed for use with thermal mass flow sensors.

2. Claim 1 in which the flow measurement section is instrumented with any other type of fluid flow sensor (such as Pitot tube, vortex shedder, turbine, sonic, etc.).

3. Claim 1 in which Flow Diffusers are used to adapt to larger or smaller pipeline sizes at either the inlet and/or outlet of the Flow Meter Body.

4. Claim 1 in which the Flow Nozzle has a concentric, converging inlet with a radial, elliptical, bell-mouthed curvature; or any other curvature that provides similar fluid velocity profile flattening properties.

5. Claim 1 in which the Flow Nozzle has an eccentric, converging curvature.

6. Claim 1 in which the Flow Diffusers have a concentric or eccentric shape.

7. A Fluid Flow Meter Body incorporating a Flow Nozzle and Flow Diffusers placed upstream and/or downstream of the Flow Nozzle, with or without a Flow Measurement Section, in which ports are installed upstream and downstream of the Flow Nozzle for the measurement of differential pressure and ports are installed for pressure, temperature for the purpose of measuring the fluid volumetric or mass flow rate for use with conventional flow instrumentation.

8. Claim 7 in which the Flow Nozzle and Flow Diffusers are concentric or eccentric, have radial, elliptical, bell-mouthed or any other curvature that provides adequate velocity profile flattening, etc.

9. Claims 1-8 in which a Flow Diffuser is used to provide the user with several sizes of inlet pipe fittings without affecting the immunity to inlet/outlet velocity profiles and a Flow Diffuser to recover static pressure and match up to a wide range of outlet pipe fittings.

10. In a flow measurement system, including a flow meter body with a flow nozzle, wherein flow disturbances may occur due to elbows, line size changes, valves and other disturbances upstream and/or downstream in the system, thereby resulting in measurement inaccuracies and/or problems in the repeatability of the measurements, the improvement comprising a flow nozzle in the flow meter body, such that the flow meter body is substantially immune to flow disturbances, accommodates smaller or larger pipe diameters, eliminates costly fabrication problems in the field, and has a relatively low end-to-end static pressure loss.

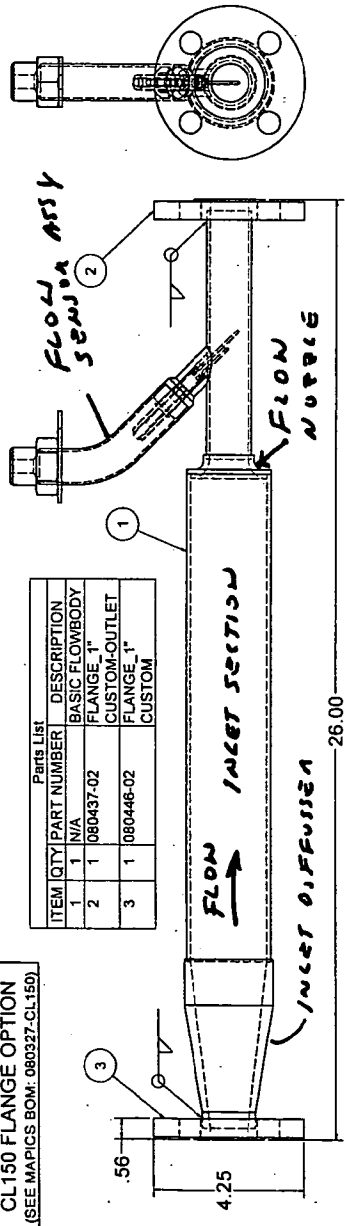
11. The improvement of claim 10, wherein the flow diffuser is placed upstream of the flow nozzle, thereby decelerating the fluid velocity and allowing the fluid to expand, flow through the flow nozzle and present a substantially repeatable, invariant, flow velocity profile, as well as provide an adapter to accommodate smaller or larger pipe sizes.

12. The improvement of claim 11, wherein the flow diffuser is placed downstream of the flow nozzle, thereby recovering a substantial portion of the pressure drop across the flow nozzle, and thereby reducing the pressure drop through the flow meter body, as well as providing an efficient method of adapting to smaller or larger pipe sizes.

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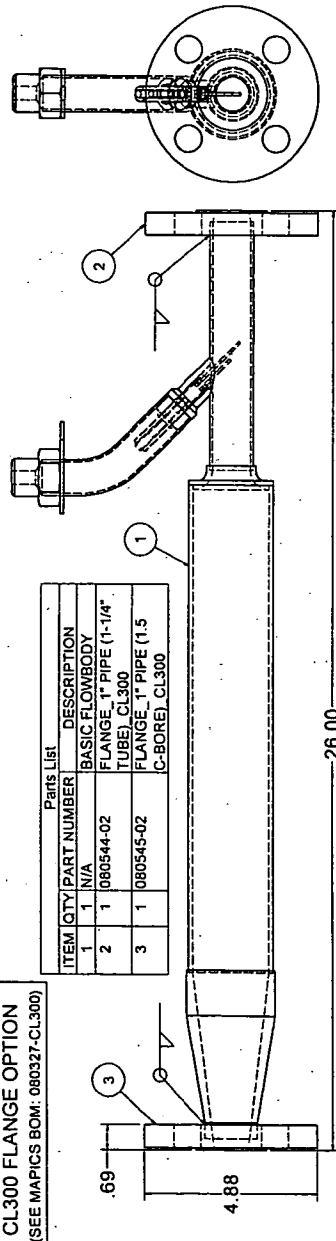
CL150 FLANGE OPTION (SEE MAPICS BOM: 080327-CL150)

Parts List		
ITEM	QTY	DESCRIPTION
1	1	N/A
2	1	080437-02
3	1	080446-02
		FLANGE 1"
		CUSTOM-OUTLET
		FLANGE 1"
		CUSTOM



CL300 FLANGE OPTION (SEE MAPICS BOM: 080327-CL300)

Parts List		
ITEM	QTY	DESCRIPTION
1	1	N/A
2	1	080544-02
3	1	080545-02
		FLANGE 1" PIPE (1-1/4" TUBE) CL300
		FLANGE 1" PIPE (1.5 C-BORE) CL300



MINPT ENDS OPTION (SEE MAPICS BOM: 080327-MINPT)

Parts List		
ITEM	QTY	DESCRIPTION
1	1	N/A
2	1	080507-02
3	1	080508-02
		1.812 LONG
		1.812 LG. BEVELED

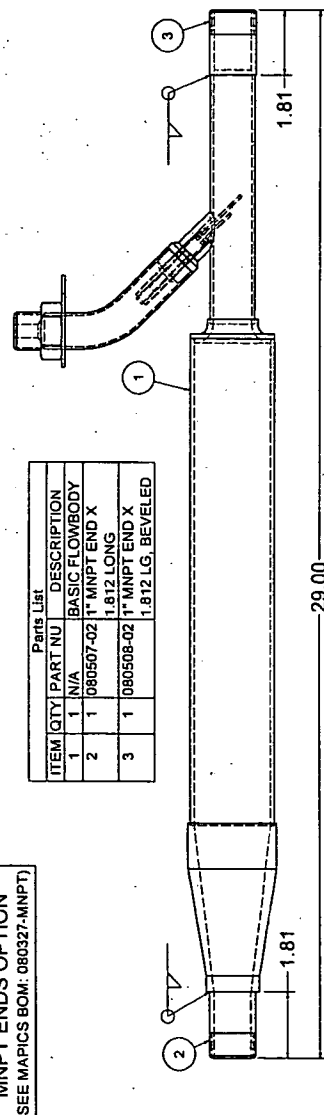


Fig. 1

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES		DATE 08/22/03	BY M. J. KURZ	KURZ INSTRUMENTS, INC.
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- NOTES, UNLESS OTHERWISE SPECIFIED:
- ALL PART LISTS IN THIS DOCUMENT INDICATE 316L SS MATERIAL AS "STANDARD MATERIAL". (SEE MAPICS BOM FOR OPTIONAL MATERIAL REQUIREMENTS)
 - CAUTION: NOTE ANGLE ORIENTATION & POSITION OF SENSOR PRIOR TO WELDING. (ALSO SEE SECTION A-A)
 - CONFIRM ALL DIMENSIONS SHOWN PRIOR TO WELDING.
 - REMOVE ALL WELD BURNS & SHARP EDGES.
 - THIS PRODUCT IS TO BE BUILT IN CONFORMANCE WITH SAFETY APPROVAL DWG #28081
 - PRESSURE TEST PER PROCEDURE #28080
 - SEE DWG 080328-OP FOR END CONNECTION OPTIONS.

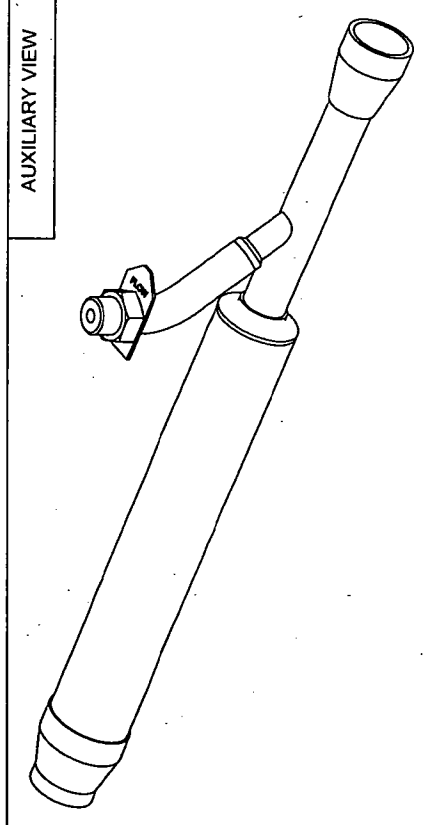
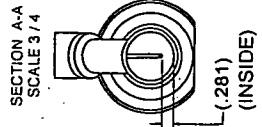
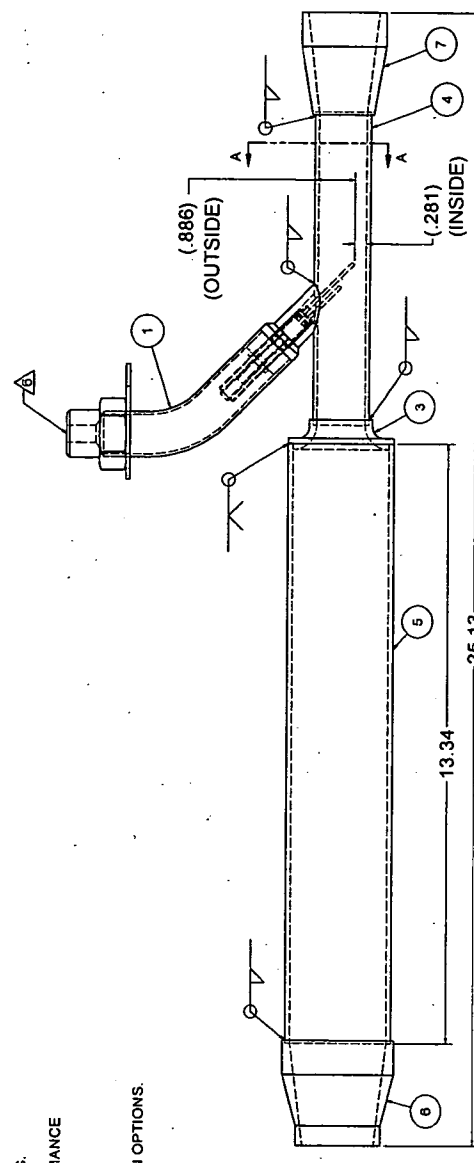


Fig. 2

Parts List		DESCRIPTION
ITEM	QTY	PART NUMBER
1	1	080381
2	1	N/A
3	1	080435-02
4	1	080438-02
5	1	080440-02
6	1	080439-02
7	1	080441-02
		OUTLET

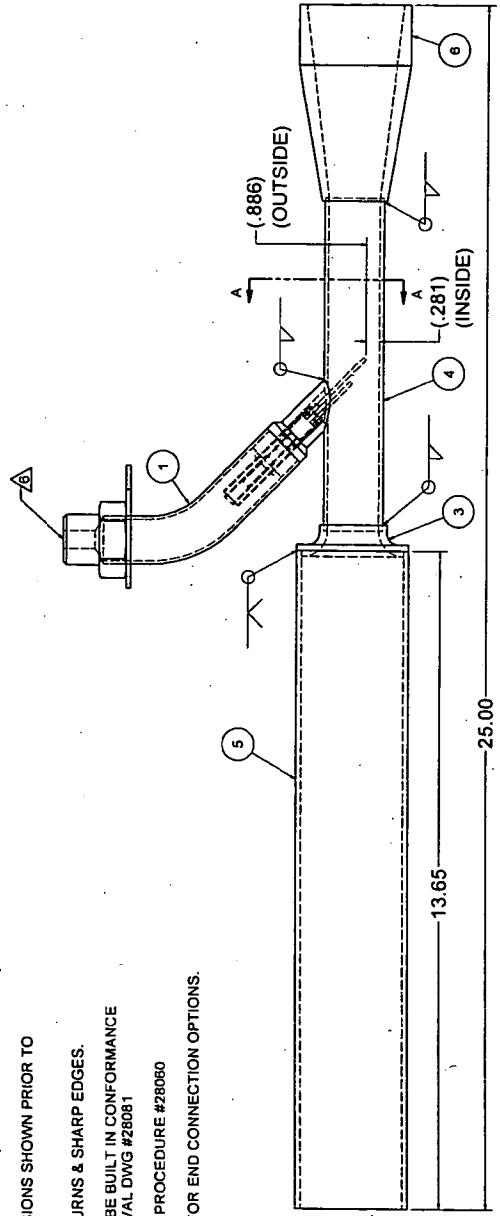
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.XXX $\pm .000$		TITLE:	
CHG. RELEASE DATE:		534FT-16B, FB ASSY (ATEX)	
D		D	
080328		080328	
SCALE:		SHEET 1 OF 1	

REV	DESCRIPTION	BY	CHKD	APPROV	DATE
1	PROTOTYPE	STEVE M	X	X	X
A	PER ECO C-47058	STEVE M	.	.	.

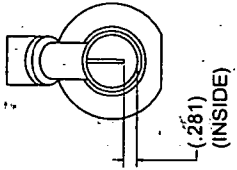
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2. CAUTION: NOTE ANGLE ORIENTATION & POSITION OF SENSOR PRIOR TO WELDING. (ALSO SEE SECTION A-A)
3. CONFIRM ALL DIMENSIONS SHOWN PRIOR TO WELDING.
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6. PRESSURE TEST PER PROCEDURE #28080
7. SEE DWG 080329-OP FOR END CONNECTION OPTIONS.



SECTION A-A
SCALE 0.80 : 1



AUXILIARY VIEW

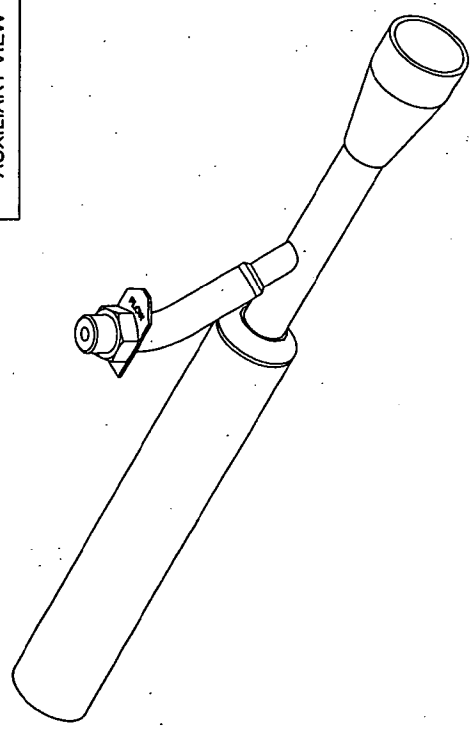


Fig. 3

Parts List	
ITEM	QTY PART NUMBER DESCRIPTION
1	1 080391 ASSY-SENSOR, 534FT-18 (ATEX)
2	1 N/A
3	1 080435-02 NOZZLE 18 FLOW
4	1 080436-02 AREA-18_COM MON
5	1 080443-02 INLET 18C
6	1 080444-02 DIFFUSER 18C

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES	DATE 10/20/2020	BY S. McDERMOTT	REV A
TOLERANCES ARE: FRACTIONS: $\pm 1/16"$ ANGLES: $\pm 1^\circ$ DECIMALS: .X XXX $\pm .005$	DATE 10/20/2020	BY S. McDERMOTT	REV A
ORG. RELEASE DATE	DATE 10/20/2020	BY S. McDERMOTT	REV A
KURZ INSTRUMENTS, INC.			
534FT-18C, FB ASSY (ATEX)			
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PAGE 1 OF 1			